

ABSTRACT OF THE DISCLOSURE

A method for preventing damage to an anti-reflective structure during removing an overlying photoresist layer. A nitrogen-free silicon oxide layer having a refractive index of 1.4-1.7 and an extinction coefficient of 0-0.5 is in-situ formed overlying a nitrogen-free dielectric anti-reflective structure to serve as a protective layer. A patterned photoresist layer is formed overlying the nitrogen-free silicon oxide layer. The patterned photoresist layer is removed by oxygen containing plasma. A semiconductor device for preventing damage to an anti-reflective structure during removing an overlying photoresist layer is also disclosed.